#### **KING SAUD UNIVERSITY**

Second Semester 36/37

#### **Math Department**

**April 13 2016** 

Math106 Midterm2 Time: 90mn

## **Question 1(3+3+3)**

a) Find the following limit

$$\lim_{x\to 1} \left(\frac{1}{x-1} - \frac{1}{\ln x}\right)^{[n]}$$

- b) Evaluate the following integral  $\int e^x \sin(4x) dx$
- c) Evaluate the integral  $\int sec^6x dx$

### **Question 2(2+3+3)**

a) Find 
$$\int \frac{1}{\sqrt{x^2+6x}} dx$$

b) Evaluate 
$$\int \frac{1}{x^3 \sqrt{x^2-1}} dx$$

c) Compute the following integral  $\int \frac{2x^2-2x+2}{(1-x)(1+x^2)} dx$ 

# **Question 3(3+2+3)**

a) Find 
$$\int \frac{dx}{5+3\cos x}$$

- b) Does the integral  $\int_0^\infty xe^{-2x^2}dx$  converge? If it converges find its value.
- c) Sketch the region bounded by the curves:  $=y^2-1$  , x=y+1 , and find its area.